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Activating the Teaching-Research Nexus in Smaller Universities: Case Studies Highlighting Diversity of Practice

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Activating the Teaching-Research Nexus in Smaller Universities: Case Studies Highlighting Diversity of Practice

The teaching-research nexus (TRN) has become an important process in the modern University, providing both identity to university scholarship and a device for the integration of academics' work. Over the last decade many reports have identified the need to both establish institution-wide processes to embed and support TRN, and assist in academic professional development in adopting TRN. This case study reports one such institutional project, focussing on one element of the staff development program, a TRN panel discussion by academics who have engaged TRN. The discussion was structured around the five TRN dimensions of: Learning through research; Research-led teaching; Researching teaching; Teaching informed research; Learning how to do research. By reflecting on their personal experiences, the presenters provided example and discussion of the diversity of options within TRN. In evaluating this event, we consider the diversity of subtlety of TRN. There are clearly advantages for students and staff alike, and TRN allows the curriculum to have a significant authenticity. In terms of teaching, research becomes a core learning tool and foundation of the curriculum. TRN then becomes the catalyst for merging boundaries between teachers and learners, lecturers and researchers: TRN becomes a truly two-way relationship.

Teaching-Research Nexus, small university, case study, professional development, Australia

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Introduction

University education can be distinguished from other higher education in that the teaching and learning is closely related to other scholarship including research, a relationship often referred to as the 'teaching-research nexus'. While university academics espouse the value of the teaching-research nexus (TRN), some are unclear about what the nexus is and how it expresses itself in an academic's work. This lack of clarity is notable among some academics that come from teaching or professional rather than research backgrounds, and whose work is often vocational in emphasis. Additionally, for some university academics whose primary role is teaching, research occupies a small proportion of their workload. Therefore, there is a need to better promote the teaching-research nexus in some sectors of universities, to enhance both teaching and research performance.

This paper reviews a program at Southern Cross University to enhance staff awareness of the teaching-research nexus, and provide a framework for staff development informed by the nexus. The program parallels the growing interest in the scholarship of teaching and learning, scholarship that allows academics to develop a research profile linked to their teaching. This paper describes and evaluates a key event in the program's calendar, a panel discussion in which five teaching-research nexus academics discussed the nexus from their individual perspectives.

The Teaching-Research Nexus

The teaching-research nexus is a fundamental characteristic of academic work (Boyer, 1990). Research and teaching are "mutually reinforcing endeavours" (Anon, 2003), and thus synergies between teaching and research are essential (Ling et al., 2007). There is an ongoing dialogue into how teaching and research can be combined, and a growing number of higher education institutions globally are devising strategies to better align research and teaching (Angelo and Asmar, 2005; Jenkins and Healey, 2005; Lyall, 2006; Zubrick et al., 2001). However, effective alignment requires careful nurturing among staff, and through the curriculum, department, institution and across the sector (Hattie and Marsh, 1996; Jenkins and Healey, 2005).

At our University, a recent study (O'Reilly et al., 2007) explored the nexus through a survey of a quarter of the full-time academic staff. In recognising both the national and global acceptance of an intrinsic association between teaching and research, it found that TRN practice at our University is diverse, often implicit rather than explicit, and constrained by institutional demands.

It also highlighted the legal obligation, through our University's Act (1993), to include the "interaction of research and teaching" among its objectives. Against this background, the extent to which teaching and research truly interact at the University was unclear. The study advised the University to strengthen its structural and implementation support for the teaching-research nexus.

The global literature indicates that the teaching-research relationship is often poorly defined; this was in evidence at our University. Furthermore, research and teaching, rather than being considered complementary, are often viewed to be separate, and often compete with one another for time and resources. The global published experience is clear that the challenge lies at the institutional scale to develop policies to encourage and support the nexus. However, for academics that may feel unable to influence institutional change, there is scope to develop their own practice within an emerging scholarship of teaching.

Boyer (1990) highlighted a framework of four scholarships – the scholarships of discovery, integration, application and teaching – as a way to value and integrate teaching and research within an academic's work. The Australian Government's Carrick Institute forum on the teaching-research nexus (Krause et al., 2007, 2008)¹ focused on four themes:

- i. the impact of the nexus on student learning;
- ii. the variety of circumstances within disciplinary contexts;
- iii. the imperatives for institutional policy change; and
- iv. the national initiatives then in play.

This characterisation of the nexus is important for us, since it was developed within the specifically Australian higher education context in which "research activity as separate from teaching, is still clearly seen as having pre-eminence when it comes to institutional rewards and recognition... [and] ... debate on policy and planning implications of how and why to link teaching and research is ongoing..." (O'Reilly et al. 2008, p. 14); furthermore, the situation has also been characterised as there remaining "a narrow conceptualisation of the TRN in Australian higher education" (Krause et al., 2008, p.7).

¹ See also <http://www.trnexus.edu.au>

Importantly, the forum identified five dimensions of the nexus that we adopted in this program:

- Learning through research
- Research-led teaching
- Researching teaching
- Teaching informed research
- Learning how to do research

A program of teaching-research nexus staff development

To evaluate the TRN staff development process, one of us (Boyd) benchmarked and assessed his own teaching and learning performance against criteria from two other universities: the University of Tasmania's focus on academic and student outcomes, and the University Melbourne's structural approach.² The Tasmania approach evaluates a programme in terms of the extent to which defined teaching and learning elements are present and engaged by both students and academics. The Melbourne approach focuses on institutional elements required to ensure the nexus operates. Assessment of Boyd's teaching and learning against these benchmarks indicated that he met all criteria for successful staff and student engagement with the nexus. More importantly, however, was Boyd's growing realisation that the nexus was a deeply influential element of his teaching and learning.

The combined experience of O'Reilly et al.'s (2007) report and Boyd's benchmarking encouraged the nexus program to engage other academics in self-critique of their own practices. The program sought to highlight the benefits of actively considering the nexus to academic staff, to allow staff to reflect upon their own nexus practice, and self-evaluate their own practice against benchmarks. The program aimed to address three questions:

1. How do academics demonstrate the teaching-research nexus in their practice?
2. How do students experience the nexus through their undergraduate curriculum?
3. What is the range of nexus possibilities in the teaching and learning program of the University?

² <http://www.utas.edu.au>; http://www.cshe.unimelb.edu.au/pdfs/TR_Nexus.pdf

The program therefore promoted various activities through an action learning approach:

- i. individual self-evaluation of nexus activity and engagement;
- ii. recording and dissemination of case studies of activities in which the nexus is embedded;
- iii. individual and small group mentoring;
- iv. small group professional development workshops;
- v. development of scholarly outputs/curriculum enhancements; and
- vi. encouragement of writing and publishing (Greenwood and Levin, 1998; Campbell and Norton, 2007; Yin, 2009).

Core to the success of these was the need to lead by example. A panel discussion was, therefore, convened, in which experienced academics would explore their own experience, framed as examples of these five dimensions.

The teaching-research nexus panel discussion

A panel discussion was convened in August 2009, with 30 academics attending. The proceedings were recorded and posted on the University's Teaching & Learning Centre web site.³ The following summaries of the presentations provide reflective examples of five academics on the panel and illustrate the potential diversity in the nexus. The presenters range across professional experience and discipline.

Case study 1: learning through research

Anja Morton is Lecturer in Contemporary Issues in Accounting, in the School of Commerce & Management. She discussed the role of scholarly research in a teaching area that usually focuses on non-critical process learning. She teaches a final year unit within an accounting degree, adopting a scholarly research perspective to encourage students to question the givens they have learnt to date. Describing an undergraduate capstone unit, Contemporary Issues in Accounting, she noted that, while accountants do conduct serious research, much accountancy education does not draw on it.

³ <http://www.scu.edu.au/support/nexus/>

Had, for example, accounting been different from the current model, the global financial crisis might have been less severe. So why do accountants not get exposed to research? Morton studies accounting paradigms, and recognises the many theories underlying modern accounting. This theme is central to her teaching: student learning is dependent on understanding competing paradigms.

Anja's learning objectives, therefore, are research based: her first is that students are able to distinguish clearly between different theories of accounting. However, students usually have not previously studied anything but bookkeeping, management accounting and management, so have not been exposed to "any idea of how we know what we know". Anja introduces them to what she calls "this thing called science", and words such as "paradigm", "falsificationism", "deduction" and "induction". "It's important for accounting students," she says, "to know where the discipline knowledge comes from: why do we do accounting the way we do it?" She believes that accounting academics must be honest and transparent about their biases towards a theory or current practice. She claims that many students are almost "brainwashed" into believing that the current accounting system is adequate, by being exposed to no or incomplete study of accounting theory. Anja strongly believes that, for a discipline like accounting, which is often thought of as routine and uncontroversial, the study of theory and research is the only means by which a university can legitimately offer something different to a TAFE⁴ education.

Anja described how students were "totally shocked when I tell them there are actually about five different better ways to measure income on a theoretical basis than we actually do in practice". Using research and theory she provides students with opportunities to gain a deeper understanding of basic accounting concepts.

They come through their previous units thinking "This is what we debit, this is what we credit and this is the amount we do it with"... then I say, "Why do you think this is what we debit? Why do you think this is the amount? Are there alternatives? And this is the research that has been done long before". Students don't even realise there has been research. We talk about positive theory versus normative theory. [We bring in] a whole range of accounting research... to show how particular hypotheses arising from the theories are tested in the real world in a positivist paradigm.

Anja recognises the limitation of teaching research approaches to non-research students. She does not ask students to read research articles, because they are

⁴ The New South Wales Technical & Further Education college education system

undergraduate students on track to a professional rather than research career, who do not at this stage need to be able to engage the research literature, but need to engage the ideas. Instead, she summarises them as springboards for discussion: “Is such and such really the conclusion you can derive from secondary data?” “What is the nature of the actual empirical research?” “What is empirical research?” As the learning continues, Anja notes that students are “surprised to find out that accounting standards have been developed through a process of induction, not a normative theory of something related to true income and value measurement”. The class is then able to ask questions of an accounting standard: “Does it make any sense?” “What theory explains the development of this particular accounting standard?” Students thus get a deep understanding of the political nature of setting accounting standards. Anja concluded by describing a student culture shift:

It's all theory and research, this whole unit. We talk about theories of regulation, public interest theory, capture theory, economic interest theory... and apply those to practice. The students come to me thinking that accounting is black and white, and they leave thinking that it's in the hands of the ruling elite who cause it to be in the form that allows them to manipulate and exploit the masses for their own purposes.

Case study 2: research-led teaching

Peter Harrison is Professor of Marine Science in the School of Environmental Science & Management. He is one of the University's highest profile researchers, and has won teaching and learning and research awards (Krause et al., 2007). As a long-term university academic, he informs his teaching with a rich record of research. Using examples from undergraduate coursework, he illustrated his philosophy that the relationship between research and teaching is not a one-way relationship, and that while his teaching draws directly on his research, there is also an opposite flow of scholarship:

Research informed teaching stimulates and motivates students, it gives them a vision for what they might become as researchers or professionals, it enhances our teaching quality, it absolutely enhances student learning, it enhances their career prospects because they can be confident about what they have learnt and know that it can be really applied in the real world, and it's great fun.

Peter starts from passionate belief that both “teaching and research – not either of them separately – are fundamentally important to universities”, and that this differentiates universities from other higher education or research-only

institutions. While he acknowledges that actively integrating both his teaching and research has been difficult at times, it has become his central theme. Peter illustrated the two-way relationship by summarising his teaching experiences over the last twenty years. Over time, he reflected, he has gone from “a complete disconnection”, where he was asked to start teaching in an area which had nothing do with his research, through to more recently being able to “strongly integrate my research in my teaching”.

When Peter first started teaching, he was asked to deliver botanical lectures in a first year biology course; as a marine ecologist this was difficult, frustrating, unsatisfying, and challenging. The next semester he was asked to teach ecology, which was better aligned to his expertise: for the first time as a lecturer, he was able to integrate some of his research. He admitted to being initially tentative about mentioning some of his research within the lectures. Student response was important: he immediately received the stimulation, engagement and feedback from students about the research-informed teaching. They asked lots of questions, particularly about his research, which encouraged him to more actively infuse his research into his teaching. He has done this ever since, acknowledging that this initial student feedback started his teaching-research approach.

The next year he was asked to again teach outside his research area, in a freshwater ecology course. Before he started, he attended a national wetlands workshop, met key researchers, and brought current knowledge and research back into teaching. Again this was successful, but Peter went a step further: he started freshwater and estuarine wetlands research and consultancies to actively align his new teaching role with his research. This provided understanding of current knowledge boundaries, which he brought back into teaching. Importantly, Peter learnt new paradigms about research in these different environments – as some different concepts drive freshwater and estuarine and marine research. Despite the steep learning curve, it reaped rewards. He could engage students in research-knowledge-driven curriculum and practical field-based learning exercises, enhanced by very practical understanding.

On field trips I would explain that what we were going to do today... even though it's pouring with rain, is exactly what you would do as professionals... engaged in research [or] as a consultant... that stimulated them to ask lots more questions. We would sometimes be faced with equipment breakdown, late buses, impossible weather....

Okay, we've got a problem, we have this many people, we need this number of working pieces of equipment... what are we going to do? And so we would engage in a whole process of learning through the experience... it helped in terms of the teaching, and students got really enthusiastic about it.

Since 2002, Peter has had what he describes as “the complete luxury of teaching topics that I am more fundamentally passionate and knowledgeable about”. He has been studying coral reefs for thirty years, and is now able to bring that knowledge to teaching in a final year course on coral reef ecology and management. He stimulates lecture debates, challenges students with questions, and provides authentic research-based field learning. The classes conduct reef surveys – exactly what researchers do: “a really enjoyable and stimulating experience for both the staff and students”. In 2002, Peter also became Director of the University’s embryonic Whale Research Centre, which grew rapidly to become a significant and recognised research centre. With this growth and the research expertise that developed in the Centre, he was able to develop a third year teaching unit, Marine Mammals. By engaging the Research Centre staff and postgraduate students, adjunct professors and fellows, and supporting their personal development as teachers, he has developed a dynamic third year teaching unit. Peter summarised this development as “an unusual way of having a research centre create another teaching unit, based on our collective experience”.

Case study 3: researching teaching

Elaine Nuske is the Lecturer in Counselling & Social Welfare in the School of Arts and Social Sciences. Her focus on the nexus is as a reflective practitioner. She is a social worker by profession, and had worked for many years as a social worker and therapist before coming to the university 12 years ago. Hers is personal reflection on her journey from being primarily a teacher to completing a PhD in 2007, subsequently entering the world of research. Researching her teaching allows Elaine to get a sense for herself an academic who cannot separate being a social worker and an academic. Indeed, her researching takes her beyond the normal limits of teaching research, and has provided her a powerful medium for professional- and self-reflection. Her research catalyses her teaching as reflective teaching, and has provided a nuanced understanding of her own scholarship.

Elaine shares the experience of many new academics who, once obtaining the PhD, are sidelined from research. In her case she was asked to take over course co-ordination of the Social Science degree. After a couple of years, she sought mentoring, looking for “something to kick start [her] research career”. She was looking for “somebody within the institution who I felt I could work with, a senior academic with a lot of experience who I seemed to gel with”. She thus joined two gambling problem research projects, projects with counselling connections. Funding had been approved, and the projects needed a co-researcher: she “just slotted in, it was really a case of being in the right place at the right time”. At the same time she also explored

possible research within the University's Centre for Children and Young People; that option has been harder to get going, but she is still trying. Importantly, these experiences helped Elaine to clarify her research goals: she recognised the need for research into how counselling is taught. "What," she asked, "are we trying to achieve in churning out these counsellors at the end of three years or people who work in social welfare: ethically and professionally, what are we doing?" Elaine continues:

I sat there and thought, "I teach group work, I teach interpersonal communication, I teach counselling theory, counselling theory 1 and 2 How does this all fit into what I am doing with my research? It doesn't all fit, there doesn't seem to be any cohesion there".

I then saw the [TRN Project advert] email, and got in touch. It has assisted me in seeing this as a whole. Now, interestingly for me, what has happened is it seems to me it's not the content of what I research that is specifically important, but how I am researching, what it means to me to be involved with people within social systems that I can actually share with my students.

Researching teaching, therefore, has become a focus of Elaine's scholarship. Adopting a reflective approach, she sees four layers as a reflective practitioner, teacher and researcher.

- Reflection on her teaching – peer review; examining class content; open to constructive and critical examination of her teaching; balancing student and teacher focus.
- Reflection as a practitioner – as a social worker and a counsellor, this is "absolutely crucial to anybody working in the field".
- Teaching her students to be reflective practitioners and critical thinkers – how to reflect and put those two together is a concrete component of what I a teaching".
- Reflection on her role as a researcher.

Elaine considers that reflecting on her role as a researcher gets complicated. If she sees herself as a teacher modelling being self-reflective, students see that she is actually involved in that learning process; they ask about this, and she can relate it back as herself as a professional and academic person. In this way, Elaine is "constantly developing, learning, attempting to use the past, present and future to come together". Elaine is thus examining the way her research and teaching fit into her academic career: "I don't like the idea of the two

being separate”. From this reflection, she identifies three key ideas about what research in teaching means to her.

- *Researching teaching consists for me of being able to consider, in a structured way, how I interact with students, to model and promote reflective practitioner role, how successful am I, and what works.*
- *Researching teaching involves me being able to review my teaching practices in terms of content and process repeatedly, to be able to ask what am I assessing about myself, why, and what am I aiming to achieve this through personal assessment.*
- *Researching teaching involves research activity linking what I teach to issues of professional industry and accreditation practice.*

Case study 4: teaching informed research

Bill Boyd is the Professor of Geography in the School of Environmental Science & Management. He is a life-long academic with a solid record as a researcher and teacher. His expertise crosses disciplines, and he works in both the earth and sociocultural sciences. While he has brought research into his undergraduate teaching for some time, here he talked about one aspect of teaching-informed research, research stimulated by student enquiry.

Bill considered his role in terms of the close teaching-research nexus, which is, in his view, the reason we are a university and not a teaching- or research-only institution. He discovered that an academic brings an approach or attitude from research to teaching. “It’s how you go about it,” he said, “how you structure knowledge, how you see the relationships between the next generation who are somehow getting something from our contribution and the world out there”. What he was less aware of was the two-way process: he illustrated this with a story of learning coming back from the students, student responses that influenced him as a researcher.

Bill described a book that challenges the authority of ownership in cultural heritage management (Carmen, 2009). Turning to Chapter 6, he discovered his research highlighted there: half the chapter is his work, alongside discussion of ownership of outer space and the anarchist philosopher Kropotkin. Bill has degrees in geology and geography and a long history of working in the geosciences; you might ask, “How can such an academic end up in a book like this?” The reason is very simple, he explained:

“It’s because I have been teaching undergraduate students at [my University]... and I’ve had to teach units I’ve got interest in but that are not my mainstream thing. I’ve had to start thinking of other ways that I can engage the students in things that I happen to think are important socially and culturally.”

He came up with an idea he calls “cognitive ownership” (Boyd, in press; defined as representing the “link between people and place defined by intellectual, conceptual and/or spiritual – all... acknowledged as explicitly socially constructed – meanings that people attach to that place”), in response to his need for a conceptual framework for teaching cultural heritage management. He could have taught by the handbook, teaching students good technocratic behaviour. However, he was then reading texts that critiqued cultural practices. Social constructivist theory especially appealed to his sense of how people behave; this provided a basis to ask students questions. In teaching heritage management, for example, he asked students, “whether, just because an Aboriginal site is called an Aboriginal site, should it solely be a place that Aboriginal people have an interest in (and thus the rest of us are excluded)?”. There are practical management implications in the answer. He set small projects in which students considered all the groups of people that might have an interest in a site or issue. The students quickly responded: “No. There is this and that group, the tourists, the managers and Aboriginal people”. About the same time, one of Bill’s postgraduate students discussed drawing a map of an archaeological site she was working on. He asked her, “What map do you want to draw? Is it a map of your engagement with this place, or is it a map of the local council’s understanding of what this place is? Is it a map of the archaeologists who were working on it, or the prehistoric occupants who used it?”. They ended up with the cognitive ownership model to conceptualise the diversity of potential maps.

In finding a way to engage students, drawing on their questions and needs, Bill developed his model of cognitive ownership, a device for science students to feel comfortable with cultural uncertainty and social complexity. It is his “frame to hang clouds on”.

It has worked in his research – he now has PhD students and local communities who use it; it has been modified and adapted, quoted and cited. And as with all good research, it continues to be a valuable teaching method: “of all of the many things I’ve written and published,” he concluded, “the papers on this topic are the papers the students will most commonly read”.

Case study 5: learning how to do research

Rebecca Coyle is Senior Lecturer in Media Studies in the School of Arts & Social Sciences. She teaches into the Bachelor of Media, a course that integrates research within all aspects of the program. She considers teaching to be a source of learning about her own research method as it parallels student learning from research. Rebecca's research has focused on media industries, production practices and innovation, and she draws on contextual data to inform analysis of media texts such as film and television productions. Her teaching and learning context is relevant to this approach, as she describes below, and was informed at an early point in her teaching practice by the work of scholars such as Manuel Alvarado (1987), a leader in the UK's Society for Education in Film and Television and once-editor of *Screen Education*.

Undergraduate learning in all fields, to more or less extent, engages with the development of knowledge practices that include research. This exemplar focuses on research skills as applied in a Media Studies context. Media teaching is informed by the evolution of the discipline from various fields, including literature and the study of texts, to sociology and the study of people and group behaviour, to production and communication studies paradigms. Learning how to research is therefore complex and informs all aspects of the media curriculum in different ways. Bertrand and Hughes (2005) identify media research as occurring across audiences, institutions and texts. The methods and approaches (at the most basic, quantitative and qualitative) required to cover these domains is part of the scaffolded learning approach discussed in the next example.

The Bachelor of Media course at SCU is one in which research is embedded in the curriculum, as working in media and communication areas is primarily about being a researcher. One of the award's key graduate attributes, "skills in critical analysis, interpretation and research", is clearly signalled to students from commencement of the study program.

A significant component of any media activity is researching stories: journalists, film makers, radio producers and others working in media research stories. "If you ask me," Rebecca observes, "not nearly enough journalists engage in rigorous research, but rather rely on press releases and secondary sources." The course also engages research in generic skills, like particular types of writing, for example, "how to write as a news or feature journalist, how to do script writing, how specific vocabulary or syntax or structures of argument operate in different media genres, all stylistically completely different to composing an essay or writing a report". Students start from the basics of gathering, analysing and interpreting information, and learning how to communicate appropriately, especially in a specific context. Learning how to research therefore involves communicating findings effectively.

SCU's Bachelor of Media course is structured around study and production units. In first semester of first year, for example, the introductory production unit covers desktop media. Students learn design and publication skills and how to apply these to a particular media production brief. They

create a poster or a cover for the local newspaper and research the newspaper's background, readership, market and distribution. They are given a brief of colour, composition, issue theme, main text, by-lines, etc. to be included, and then design to that brief. Their production must be accompanied by a rationale explaining the application of their background research to their submitted work. Elsewhere, students learn other research methods via media textual analysis, political/economic frameworks, cultural and/or media theory. Their first year studies groom them for research into industrial backgrounds and production studies, "examining how a media text has been made in particular ways, how the production method informs the text, why and who has produced it, what budgets they worked within, the industrial constraints on the production, etc.". This pattern of curriculum follows through the three years.

Research is also embedded in practical work-integrated learning. Students doing a professional placement internship in the final year need to research the workplace, its industrial context, and why that is the kind of workplace they want to enter. They need to pitch their skills, attributes, experience and curriculum vitae (with portfolio) to potential workplaces. Two other third year units, Arts Project and Arts Industry Studies, are both project-driven and based on individually or small-team devised research projects. These units develop skills that inform self-initiating and research-driven projects either in the workplace or in future study programs such as Honours and postgraduate courses. In Arts Industry Studies, students create a business plan for a future enterprise. Arts Project can entail a critical or discursive analysis, or an in-depth creative production with exegesis. The teaching-research nexus is evident in several activities directed to learning how to do research in different contexts and applying it to a variety of outcomes.

Discussion

These five case studies highlight some of the diversity of the teaching-research nexus. The purpose of the panel discussions was to draw the experience of engaged academics to the attention of the wider academic community. The project later brought three international experts in the field to the University to run workshops developing the themes introduced in this panel discussion. There is a continuing interest amongst individuals and groups of academics, mostly relative early career academics, in self-review and critique and writing projects.

Part of the success in engaging academics and providing a foundation for professional development lies in clarifying for academics what the nexus is and can be. The case studies all indicate that even experienced researchers continue to learn within the nexus. All comment on the growth of their capacity for, and understanding and implementation of, the nexus in their scholarly work. Of particular note is the close bi-directional interaction of research and teaching evident in all the case studies. This reflects very strongly Boyer et al.'s (1990, p.13) characterisation of "a new vision of scholarship", an integration of the scholarships of discovery, integration, application and teaching. Indeed, the case studies represent situations that go beyond Boyer's notion that the "work of the professoriate might be thought of as having four separate, yet overlapping, functions" (p.16). Interactions between research and teaching are clearly evident in all our examples, and the scholarships of research and teaching can no longer be considered as separate. In a pragmatic sense, the case studies here demonstrate the practical path beyond the assessment dilemmas discussed by Glassick et al.'s, (1997) follow-up on Boyer's initial report: that the nexus works as a successful teaching and learning device is evidenced by the fact that the presenters have been awarded various university and national teaching and learning awards in recognition of this. These studies contribute to the argument that Hughes (2005) raises against the myths of separation, and support Brew and Boud's (1995) view that since both research and teaching involve the learning, discovery or construction of knowledge, they are inseparable (Brew and Boud, 1995).

Each of the presenters described their own stimulus: demands on teaching outside their discipline; defining a new research area; the needs for teaching structures or devices; the challenges of a paradigm shift in a curriculum; the practical demands of professional training; the demand for evidence-based performance data. While our presenters had found their individual stimuli, many academics have not. To assist others, we consider the five conceptions of the nexus used by Krause et al. (2007) to stimulate discussion.

1. *The TRN epitomizes teaching and learning in higher education.* All the presenters started from this standpoint. More importantly, all demonstrated the essential role that a relationship between research and teaching play in their individual forms of teaching and learning. The teaching they describe would not have developed as it did, nor have been as successful, had it been linked to a formal syllabus uninformed by the individual academics' particular research experiences. Indeed, had the academics not been research active, the types of teaching and learning described here would not have evolved: Morton would not have been able to draw on the theoretical literature to challenge the student; Boyd would not have created his "frame to hang clouds on".

2. *The TRN engages and motivate students.* Engaging students lies at the core of all the case studies, whether it is in providing the latest research, insights into and skills of professional practice, challenging students intellectually or providing frameworks for learning; the case studies address all the benefits outlined by Garnett & Holmes (1995). The case studies included evidence of motivation, notably through the enthused response to lecturers. Harrison's encouragement to engage the nexus more deeply, for example, was a direct effect of student motivation, while Morton's students departing views represent culture shifts only possible amongst motivated students.
3. *The TRN develops important graduate attributes.* Coyle's description of the essential role of research in the undergraduate curriculum explicitly referred to graduate skills. All the case studies reflected on the professional-practical benefits of the nexus: students time and again, regardless of discipline, were being prepared for professional and postgraduate activity. Harrison's field-ready students, for example, and Nuske's reflective practitioners will be ready for careers in their respective fields.
4. *The TRN prepares students for future employment.* This overlaps with the previous conception. The clearest example in our case studies is Coyle's description of undergraduate media education: "working in media is primarily about being a researcher".
5. *The TRN offers professional benefits for academic staff.* This is a significant conception, one that may offer many academics the necessary incentive to commence engagement with the nexus. The case studies provide ample examples of this. Boyd's students, for example, read his scholarly papers; Harrison can value-add his research centre activities by engaging student and staff across the research-teaching boundary; Nuske's sense of self as a counsellor is greatly enhanced through her engagement with students.

There is a further conception of the nexus, explicit in many published discussion papers (e.g. Zubrick et al., 2001), i.e. the benefit to, and relationship with, the institution. Many of the papers on scholarship of teaching and learning in journals such as, for example, the *International Journal of Scholarship in Teaching & Learning* focus on student feedback, performance and graduate survey data sources to evaluate and critique teaching and learning activities and approaches. The TRN literature reflects a broadly held view that a vibrant nexus relies on the support of university administrators who will be motivated by metrics of teaching and learning quality such as graduate survey data and course feedback that in the Australian context translate directly into government funding. Conceptions 2, 3 and 4 above all contribute directly to improved outcomes in these metrics because students with a clear engagement with research processes, outcomes and

application will be more likely to provide positive feedback at all stages of their study and subsequent careers. They are also more likely to improve the general reputation of the university within the community, attracting students seeking to be taught by lecturers at the cutting edge of their field of interest - a very positive feedback loop.

We close, by reflecting on the framework of five dimensions of the nexus, and despite our disciplinary differences our core lesson is that definitions and boundaries are less important than the commonalities. These commonalities lie at the core of the nexus and its implementation, and provide practical reasons for further engagement. From a professional development perspective, they provide stimuli for previously non-engaged staff. Nexus engaged academics and others all bring unique and specialist experience, ethos, attitude and perspectives of knowledge and scholarship to their teaching and learning: their fundamental philosophy as researchers and scholars shapes their approach to teaching and learning. In doing so, research provides conceptual foundations for critical engagement in learning. The practical experience of being a researcher enhances disciplinary learning, reflected in the spillover to fully understanding the pragmatics of professional behaviour. This is authentic learning at its best (Lombardi, 2007). In terms of teaching practice, research becomes a core learning tool, and thus a foundation of the curriculum. With this in place, the nexus becomes the catalyst to encourage the merging of boundaries between teachers and learners, lecturers and researchers, and for the nexus to become a truly two-way relationship. The teacher-researcher grows through the process – all our case studies provide ample evidence for enhanced lecturer awareness of the lessons of their teaching – and students develop as critical thinkers and engaged practitioners.

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